REMARKS

Reconsideration of the application is respectfully requested for the following reasons:

1. Rejection of Claims 1 and 2 Under 35 USC §103(a) in view of U.S. Patent Nos. 4,712,031 (Anderson) and 6,024,496 (Shy)

This rejection is respectfully traversed on the grounds that the Anderson and Shy patents fails to disclose or suggest a bearing structure in which a race rotatable with the shaft has a circumferential edge that almost or completely **contacts** the shaft to ***eliminate*** **clearance** (*i.e.*, to "minimize any gap") between the race and an inner wall of the shaft seat.

It is noted that the recitation of gap minimization is supported by page 3, lines 18-19 and page 4, lines 5-6 of the original specification, and therefore does not represent "**new matter**."

Instead of a rotating race that contacts the inner wall of the shaft seat to minimize any gap, as claimed, the metal retaining ring 53 of Anderson is designed to intentionally maintain a clearance so as to avoid contact between the retaining ring and the shaft seat, and thereby permit free rotation of the shaft seat (housing) relative to the ring. On the other hand, the rubber ring seal 94 of Shy is arranged is attached to the sleeve bearing 93 and not arranged to rotate with the shaft. Thus, the prior art teaches:

- a stationary rubber ring seal attached to a bearing (Shy); and
- a metal washer that rotates with the shaft and intentionally avoids contact with the shaft seat so as avoid interference with rotation of the shaft.

It is respectfully submitted that these two teachings do not reasonably suggest the claimed:

- flexible race that rotates with the shaft *and* eliminates clearance (minimizes a gap) between the race and the inner wall of the shaft seat.

The clearance function of the metal ring of Anderson is clearly described in col. 3, lines 1-5 of the Anderson patent:

> *In order to seal the chamber 48 outboard of the bearing 38, an aluminum retaining ring 53 is pressed tightly onto the shaft 13 but is received in the housing 28 with* **radial clearance** *so as to permit the housing to rotate relative to the ring.*

Because the ring of Anderson is made of aluminum and is not a flexible seal, contact with the inner wall of the shaft seat would cause friction and interfere with rotation of the shaft. Therefore, the claimed clearance elimination is contrary to the teachings of Anderson, and Anderson can be said to ***teach away*** from the claimed invention.

Furthermore, the Examiner will note that the retaining ring 53 of Anderson must be disposed between two washers 57, 58 so that the retaining ring 53 and the two thrust washers 57,58 commonly seal chamber 48. The purpose of this arrangement is necessary to permit axial pulsation of the shaft, and is more complicated and difficult to assemble than the rotating race and washer of the claimed invention.

The Shy patent hardly suggests elimination of the clearance of Anderson. Instead, it concerns a stationary seal that sits onto of the bearing and permits free rotation of the shaft. Since the metal retaining ring 53 is pressed tightly onto the shaft 13 of Anderson, one of ordinary skill in the art could not have expected that modification of retaining ring in accordance with the teachings of Shy would have any chance of success.

The Examiner is respectfully reminded that each of the applied references must be considered as a whole, including passages that teach away from the claimed invention, since the ordinary artisan would not have been able to use Applicant's claims as a template to determine which passages to ignore and which to consider. As stated in **MPEP 2143.02**:

> *If the proposed modification or combination of the prior art would* ***change the principle of operation of the prior art invention being modified****, then the teachings of the references are not sufficient to render the claims prima facie obvious* (citing In re Ratti, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)...*The court reversed the rejection holding the "suggested combination of references*

> *would require a* ***substantial reconstruction and redesign*** *of the elements shown in [the primary reference]* ***as well as a change in the basic principle under which the [primary reference] construction was designed to operate"*** *123 USPQ at 352.* (See also, MPEP 2141.02, p. 2100-107 "**A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention** (emphasis in the original).

It is respectfully submitted that modification of the rotating metal ring with clearance taught by Anderson to include a flexible ring without clearance represents precisely the type of redesign referred to in the MPEP, particularly since the secondary reference teaches not a *rotating* flexible race, but rather one that is fixed to the bearing.

In summary, the Anderson patent does not include any teachings suggestive of replacing the flexible stationary ring of Shy with a flexible rotating ring that eliminates clearance between the rotating ring and shaft seat (since Anderson teaches an inflexible metal ring that requires clearance rather than a flexible stationary one), and the Shy patent does not include any teachings suggesting of replacing a rotating metal ring with clearance by a flexible rotating ring without clearance (since Shy teaches a flexible stationary ring and not a rotating one). Withdrawal of the rejection of claims 1-2 under 35 USC §103(a) in view of the Anderson and Shy patents is therefore respectfully requested.

2. Rejection of Claims 4-8 Under 35 USC §103(a) in view of U.S. Patent Nos. 4,712,031 (Anderson), 6,024,496 (Shy), and 3,359,048 (Lowe)

This rejection is respectfully traversed on the grounds that the Lowe patent, like the Anderson and Shy patents, fails to disclose or suggest a race that is fitted onto and **rotates with** the shaft (like the ring seal of Shy, Lowe's ring is fixed with respect to the bushing); and that includes a circumferential edge almost or slightly in contact with an inner wall of a shaft seat Lowe's stationary ring is resiliently pressed against the shaft seat), as claimed.

As noted in the previous response, bushing 68 of Lowe, which the Examiner interprets as an elastic "race," is fixed with respect to the "seat" 20, the shaft rotating relative to the bushing, rather than with the bushing. This is ensured by spring 84 which *axially* compresses

the bushing against shaft seat 20 via pressure ring 78. The bushing itself is made of Teflon, so minimize friction between the shaft and the bushing, and is "*placed under axial compression, so as to form a seal between the front part of the housing* [*i.e.*, the so-called "shaft seat"] *and this seal, so as to safeguard against leakage under conditions of extreme low temperature* (col. 2, lines 67-72).

In contrast to the stationary seals of Lowe and Shy, which rely on a tight fit between the housing or shaft seat and the seal, and in contrast with the rigid ring and washer structure of Anderson, the present invention takes the approach of using a rotating race with slight contact with the shaft seat, to seal in oil and prevent dust ingress. This approach taken by the claimed invention is opposite to those of Lowe, and therefore the Lowe patent could not possibly have suggested modification of the shaft arrangement of Anderson, even when considered in view of the Shy patent, to obtain the claimed invention. Withdrawal of the rejection of claims 4-8 under 35 USC §103(a) is accordingly requested.

Having thus overcome each of the rejections made in the Official Action, withdrawal of the rejections and expedited passage of the application to issue is requested.

Respectfully submitted,

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